

NAVAL WAR COLLEGE

Newport, RI

COMMAND AND CONTROL (C2) IN JOINT OPERATIONS: SEPARATE  
FUNCTIONS, THEIR PURPOSE, AND APPLICATION TO BATTLE COMMAND IN  
THE 21<sup>ST</sup> CENTURY

By

David R. Hampton, Jr.

LTC, U.S. Army

A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

Signature: 

Faculty Advisor: Dr. Jim Miskel

18 May 1998

## REPORT DOCUMENTATION PAGE

1. Report Security Classification: UNCLASSIFIED			
2. Security Classification Authority:			
3. Declassification/Downgrading Schedule:			
4. Distribution/Availability of Report: DISTRIBUTION STATEMENT A: APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.			
5. Name of Performing Organization: JOINT MILITARY OPERATIONS DEPARTMENT			
6. Office Symbol: C		7. Address: NAVAL WAR COLLEGE 686 CUSHING ROAD NEWPORT, RI 02841-1207	
8. Title (Include Security Classification): Command and Control (C2) in Joint Operations: Separate Functions, their Purpose, and Application to Battle Command in the 21 <sup>st</sup> Century. (U)			
9. Personal Authors: LTC David R. Hampton, Jr., USA			
10. Type of Report: FINAL		11. Date of Report: 18 May 1998	
12. Page Count: 18			
13. Supplementary Notation: A paper submitted to the Faculty of the NWC in partial satisfaction of the requirements of the JMO Department. The contents of this paper reflect my own personal views and are not necessarily endorsed by the NWC or the Department of the Navy.			
14. Ten key words that relate to your paper: Command and control are separate functions and critical to joint operations!			
<p>15. Abstract: The command and control function at the operational level is the most important operations function because it ties together the other functions at all levels of war across the range of military operations. Successful command and control is dependent on the commander's judgment, experience, intuition, and leadership abilities.</p> <p>Command and control (C2) must be examined as separate functions to understand their role and purpose on the 2010 battlefield. The vital components of command, leadership and decision-making are critical centralized activities that, if executed properly, inspire subordinates and instill confidence in them. Control, inherent in command, must be decentralized as a rule in order to retain initiative, flexibility, and the freedom of action our subordinate commanders require to be successful.</p> <p>The dynamics of Battle Command, the Army's C2 combat function, are not only applicable to the operational level of war, but they also should be included in our joint doctrine. Leadership, decision-making, assimilation, visualization, conceptualization, and communication are elements of battle command that allow commanders to decentralize control and execution without the loss of their command responsibility.</p> <p>Although information superiority is justifiably critical to our success on the 2010 battlefield, we must pay closer attention to the command and control function. This function and its components will shape our destiny in the 21<sup>st</sup> century.</p>			
	Unclassified  X	Same As Rpt	DTIC Users
17. Abstract Security Classification: UNCLASSIFIED			
18. Name of Responsible Individual: CHAIRMAN, JOINT MILITARY OPERATIONS DEPARTMENT			
19. Telephone: 841-6461		20. Office Symbol: C	

Abstract of

**COMMAND AND CONTROL (C2) IN JOINT OPERATIONS: SEPARATE  
FUNCTIONS, THEIR PURPOSE, AND APPLICATION TO  
BATTLE COMMAND IN THE 21<sup>ST</sup> CENTURY**

The command and control function at the operational level is the most important operations function because it ties together the other functions at all levels of war across the range of military operations. Successful command and control is dependent on the commander's judgment, experience, intuition, and leadership abilities

Command and control (C2) must be examined as separate functions to understand their role and purpose on the 2010 battlefield. The vital components of command, *leadership* and *decision-making* are critical centralized activities that, if executed properly, inspire subordinates and instill confidence in them. Control, inextricably linked to command, must be decentralized as a rule in order to retain initiative, flexibility, and the freedom of action our subordinate commanders require to be successful.

The dynamics of Battle Command, the Army's C2 combat function, are not only applicable to the operational level of war, but they also should be included in our joint doctrine. Leadership, decision-making, assimilation, visualization, conceptualization, and communication are elements of battle command that allow commanders to decentralize control and execution without the loss of their command responsibility.

Although *information superiority* is justifiably critical to our success on the 2010 battlefield, we must pay closer attention to the command and control function. This function and its components will shape our destiny in the 21<sup>st</sup> century.

19980825 067

## Thesis

The command and control function at the operational level remains a critical, if not the most important operations function as it is the means by which any commander synchronizes activities in time, space, and purpose in order to achieve unity of effort. Clearly, command and control (C2) ties together the operational functions at all levels of war and echelons of command across the range of military operations.<sup>1</sup> The discussion of C2 found in Joint Vision (JV) 2010 and especially, The Concept for Future Joint Operations (CFJO) reinforces just how critical this function is to the operational commander. Regardless of innovative technology, increased battlespace awareness, and information superiority, successful C2 is dependent on the commander's judgment, experience, instincts and wisdom.

The purpose of this paper is to further examine the command and control function as it applies to the operational commander. First, I want to explore command and control as separate functions not only to provide a better understanding of their roles and purpose on the battlefield, but also because the discussion of C2 in joint doctrine can be confusing if not conflicting. On the one hand, the CFJO concludes that due to increased battlespace awareness, refined decision making processes, and information superiority available to the operational commander, he is now capable of making tactical level decisions from his operational headquarters.<sup>2</sup> If you accept this premise, you then have to reconcile the document's argument that the challenges of operational command and control will place an even higher dependency on decentralized execution. In fact, with more opportunity for operational commanders to operate inside the enemy's decision cycle, and exploit

---

<sup>1</sup> Commander, Joint Warfighting Center, Concept For Future Joint Operations-Expanding Joint Vision 2010 (Fort Monroe, VA: May, 1997), 65.

short lived opportunities presented by opponents, there may be a valid argument to push command and control authority down to the tactical level. Similarly, Joint Vision 2010 is somewhat confusing, stating that new capabilities provide greater freedom at the tactical level in maneuver, planning, and coordination. However, the document is quick to point out that, "commanders at higher echelons will use these technologies to reduce the friction of war and to apply precise centralized control when and where appropriate."<sup>3</sup>

The issue I'll attempt to resolve is whether operational commanders should make tactical level decisions; or whether they should use technological advances (battlespace awareness and information superiority) and refined decision making processes to provide clear, frequent updates of the commander's intent and delegate execution to the lowest tactical level. Next, I want to introduce and discuss the Army's "Battle Command" function. Similar in many ways to operational C2, the dynamics of "battle command" include key elements that have tremendous application at the operational level and in a joint environment. Finally, I will discuss centralized versus decentralized command and control in greater detail, highlighting the advantages and disadvantages of each as they apply to the joint force commander. From this examination, it will become clear that decentralized command and control must be the rule at the operational level to ensure successful future joint operations.

### **Command and Control as Separate Functions**

The CFJO provides a thorough discussion of command and control as it relates to the operational level of war. Identified as the most important function in military operations, it clearly binds the new operational concepts into a single concept enabling

---

<sup>2</sup> Ibid., 68.

<sup>3</sup> Joint Chiefs of Staff, Joint Vision 2010 (Washington, D.C.: Undated), 15.

the Joint Force Commander (JFC) to conduct decisive operations.<sup>4</sup> While the C2 function relies on the commander's ability to plan, conceptualize, apply past experiences, lead, and make sound decisions, the CFJO concludes that information superiority is the C2 function's key enabler. The impact that information superiority has on the C2 function is best described using the Observe-Orient-Decide-Act (OODA) Loop. *Observe* focuses on data sensing and collection; *orient* will analyze and fuze an array of inputs into timely and relevant information resulting in the Joint Force Commander (JFC) having accurate and near real-time battlespace awareness. The next step in the OODA Loop process indicates that the JFC in 2010 uses this vast amount of information to quickly grasp the situation, visualize the consequences of various possible actions, identify risks and appropriate control measures, then *decide*! Then, the JFC translates decisions into intent and orders, which are sent quickly throughout the joint force so that various components can *act*.<sup>5</sup> Without question, information superiority will play a key role in the twenty-first century. Greater amounts of information will be available faster and systems will be established to filter the information for accuracy and critical importance as it affects the JFC. However, the commander's ability to rapidly and accurately *decide* is based not on new technology or this wealth of information superiority; rather, it rests on his ability and experience as a leader and a decision-maker.

In order to support this claim, definitions and a more in-depth analysis of command and control are required. "C2 is not one word, although we often tend to treat the term as such."<sup>6</sup> *Command* means having the authority and responsibility for using

---

<sup>4</sup> Commander, Joint Warfighting Center, 66.

<sup>5</sup> Ibid., 67.

<sup>6</sup> Leonard P. Wishart III, "Leader Development and Command and Control," Military Review, Jan-Feb 1997, 63.

resources effectively to accomplish assigned missions. It is the art of motivating and directing people and organizations into action toward a specific goal. *Command* requires understanding the current state of friendly and enemy forces, visualizing future force relationships that must exist to accomplish the mission, formulating concepts of operations to achieve that state, clearly communicating commander's intent and orders to subordinates, and supervising execution through active leadership.

While *command* is the art of directing, *control* regulates forces and functions to execute the commander's intent. Inherent in the exercise of command, *control* allows the staff to assist commanders by computing requirements, allocating means, and integrating efforts consistent with the commander's intent and concept of operations. *Control* serves its purpose if it allows commanders the freedom to operate, delegate authority, and place themselves in the best position to lead, and synchronize actions throughout the battlespace.

I fully support the Army's argument that the two most vital components of command are leadership and decision making. The successful 2010 commander must possess these two abilities in order to make timely, accurate decisions, which are then transmitted throughout the command for execution. Confident and competent leadership is the most essential dynamic of combat power.<sup>7</sup> Leadership is taking responsibility for decisions, being loyal to subordinates, and inspiring and directing assigned forces and resources toward a purposeful end. It is establishing a teamwork climate that engenders success, demonstrating moral and physical courage in the face of adversity, and providing the vision that both focuses and anticipates the future course of events. Evidence of

---

<sup>7</sup> Battle Command Battle Laboratory, Battle Command: Leadership and Decision Making for War and Operations Other Than War (Draft 2.1) (Fort Leavenworth, KS: April 22, 1994), 11.

effective leadership is the value-based unit cohesion and functional discipline that ensures teamwork and best efforts toward mission accomplishment. Commanders must ensure their soldiers understand why they are involved in a particular operation and how it supports and is essential to national interests.

Decision-making is knowing *if* to decide, then *when* and *what* to decide; these are tactical, operational, and strategic judgments.<sup>8</sup> A commander must anticipate the activities that will be put into motion once a decision is made. In order to decide the JFC or battle commander must understand his higher commander's intent two levels up. He must understand the battle from the perspective of his subordinate commanders and the units adjacent to him. Commanders at the strategic, operational, or tactical level make different types of decisions. Commanders at all levels provide the intent, the concept, and then resource the requirements. Strategic and theater commanders principally allocate the means for subordinate commanders to accomplish the mission. While operational level commanders may allocate means, their primary focus is on committing the available force into the battle space. In so doing, the operational level (and higher tactical level commander) set the conditions for decisive outcomes.<sup>9</sup> Ultimately, the commander must determine which decisions designated subordinates may make. Typical decisions retained by the commander are changes in intent, mission, concept of the operation, priorities, or a major reallocation of means, and requests to his commander for additional means.

While information superiority plays a critical role in the 2010 OODA Loop, we must not forget that information systems are not capable of making decisions; they only

---

<sup>8</sup> Headquarters, Department of the Army, FM 100-5 Operations (Washington, D.C.: June 14, 1993), 2-14.

<sup>9</sup> Battle Command Battle Laboratory, 12.



provide information so the commander can make informed decisions that impact on command and control. Assimilating information that is relevant to the operation and accurate in terms of time, space, and forces are critical to timely decision making. Therefore, the competent 2010 commander must be proficient in leadership and decision making.

The CFJO also argues that two critical parts to command and control, planning and execution, together synchronize and sustain the application of military force throughout the Joint Operating Area so that the purpose of all battlespace functions, processes, and components are unified in a common effort.<sup>10</sup> Essentially, as a result of advanced information systems (AIS), planning and executing military operations may significantly change. For example, commanders and staffs may be able to centralize planning efforts while becoming less centralized in their locations. The rapid exchange of information throughout the battlespace could likely mean near simultaneous, more interactive planning which could affect operational tempo. Moreover, this AIS technology will increase battlespace awareness, thus achieving a tempo of operations that will overwhelm our opponents. As a result, this battlespace awareness also permits leaders to operate more effectively within the commander's intent and to act in the absence of direct control.<sup>11</sup>

Most would agree that information superiority has "flattened" organizations and widened a commander's span of control. Maintaining the high tempo of activity required in sustaining the initiative means that many decisions are required at each level of command simultaneously. More emphasis should be placed on intelligent delegation of

---

<sup>10</sup> Commander, Joint Warfighting Center, 67.

<sup>11</sup> Ibid., 68.

decision making rather than on increased centralization.<sup>12</sup> With so much information available to the staff and commander, the challenge becomes the mental processing of the information into consistently sound and timely decisions. In other words, "the analysis and decision-making process must be accelerated so leaders at all levels can make the right decisions in a timely manner."<sup>13</sup>

Why is delegation so important? In terms of spans of control and time, there are several reasons. First, a decision-maker can only process so much information in a given space of time. Too much time and attention spent on one issue delays attention to other issues. Second, tremendous capabilities available to the commander and his staff are not used when too many decisions have to be made. In many cases, they simply don't have the time to absorb and process this information. Finally, the meaning of new and unexpected information is not recognized and therefore, not acted upon. In short, "a belated decision causes a formation to be tied up in ineffective 'marching and counter marching' or precious long range precision fires to be employed ineffectively."<sup>14</sup>

From a different perspective, suppose a commander has information at hand to make decisions for a subordinate level. However, he chooses not to do so because it would increase the number of decisions he would have to make in a given span of time and risk delaying the tempo of operations. Likewise, if the commander attempted to make decisions for all of his subordinate units, his 'span of control' would be so ineffectual that initiative, freedom of action, and flexibility in those units would be lost.<sup>15</sup>

---

<sup>12</sup> Huba Wass de Czege, "Battle Command Insights," (Unpublished After Action Review, Fort Leavenworth, KS: June, 1996), 4.

<sup>13</sup> Wishart, 63.

<sup>14</sup> Ibid. 5.

<sup>15</sup> General Wass de Czege provides excellent examples of this in his report. He believes commanders understand this concept in theory, but violate it in practice for two reasons. First, the commander becomes fixated on the current engagements of his subordinates and neglects to focus on the decisions which need to

Therefore, staffs work within command intent to direct and control units and resource allocations to support the commander's desired endstate. Staffs also identify enemy or friendly situations that require command change and ensure the commander is so advised. Tools for implementing command decisions include communications, computers, and intelligence.

In summary, command and control are separate functions. *Command* is the art of directing; it involves communicating intent and setting objectives. *Control* is the science of regulating the effort towards intent and achieving objectives. "*Control* monitors the status of organizational effectiveness and identifies deviations from set standards and corrects them."<sup>16</sup> While the command function is designed to be more centralized, the control function should be decentralized in order to maximize effectiveness.

### **Battle Command**

An equally important aspect to the discussion of operational command and control is the Army's concept of "battle command." Applicable at the operational level, battle command requires leaders at any level to assimilate a great deal of information in order to visualize the battlefield (tactically) or battlespace (operationally), assess the situation, and then direct the military action required to achieve victory. A closer look at the dynamics of *battle command* will demonstrate that it can and should be applied at the operational level which further supports my assertion that decentralized execution is paramount to achieving success at the operational as well as tactical levels of war.

---

be made at his level, including setting the outcomes for the next operation. Recognizing which decisions are properly his is a matter of command experience. Second, commanders violate this concept because they are instinctively "in charge" people. However, as commanders mature and gain experience, they begin to understand that subordinates will not act freely and decisively when they should if their superior commander interferes and second-guesses their decisions. Mature commanders recognize that they can accept less than perfect solutions by subordinates as long as they make them rapidly and decisively within the context of the essence of their intent, and if they are aware of what their subordinates are doing.

“Battle Command is the art of battle decision making, leading, and motivating soldiers and their organizations into action to accomplish missions. It includes visualizing current state and future state, then formulating concepts of operations to get from one to the other at least cost...it is a dynamic and iterative process. Battle Command also includes assigning missions; prioritizing and allocating resources; selecting the critical time and place to act and knowing how and when to make adjustments during the fight.”<sup>17</sup>

While the joint arena includes command and control as a critical operational function, the Army introduced “battle command” in 1993 as an equally key combat function. Prior to its introduction, the Army traditionally discussed command and control as the means to execute doctrine. The intent of the term, battle command, though was to shift the Army’s focus from facilities (command posts and headquarters) to the commander himself. More importantly, it is not a replacement of terms, but a paradigm shift in how the Army intends to plan and execute operations.<sup>18</sup> Battle command focuses on fundamentally competent leaders who have an intuitive sense for battle; it is the ability to demonstrate immediate cognition without rational thought and inference.<sup>19</sup>

The proper application of the dynamics of battle command will determine the effectiveness of the battle commander’s actions. The dynamics involve six primary elements; they are leadership, decision making, information assimilation, visualization, conceptualization, and communications, all of which must be balanced by the battle commander. The first two, leadership and decision making have already been introduced and discussed.

---

<sup>16</sup> Headquarters, Department Of the Army, 2-15.

<sup>17</sup> Battle Command Battle Laboratory, 17. (BCBL gives credit for this definition to FM 100-5; however, the exact definition doesn’t exist. Rather, FM 100-5 explains the concept of battle command, which BCBL translated into a definition).

<sup>18</sup> Daniel P. Nolan, “Battle Command,” (Unpublished Research Paper, Fort Sill, Oklahoma: 1997) 2.

<sup>19</sup> Battle Command Battle Laboratory, 25.

A third element is information assimilation. Similar to information superiority, information assimilation recognizes the vast amount of information that is available to the commander. More importantly, it dictates that the commander must assimilate, or grasp a great deal of information in order to visualize the battlefield, assess the situation, and direct the military action required to achieve victory. Assimilation is used to analyze information, then synthesize it to form a vision of what must be accomplished. It is facilitated in the Army by the identification of and planning for the Commander's Critical Information Requirements (CCIR).<sup>20</sup> CCIR are a specified number of critical items of information a commander determines are necessary in order to understand the flow of the operation. Based on level of experience, decision-making processes, and intuition, each commander has unique information requirements. Equally important, a commander must focus the staff on what he believes is critical to mission success. As the operation is executed, the staff must review CCIR for critical, accurate items of information; new requirements may be added while irrelevant ones are deleted. In this way, the battle command system delivers information for the key decisions a commander must make at the right time and place.

Visualization and conceptualization go hand in hand. Visualization is forming a mental picture of the current and future states based on commander's intent, available information, and intuition. The ability to picture the enemy, friendly forces, and terrain in terms of time, space and purpose form the basis of the commander's estimate.<sup>21</sup> Conceptualization is the commander's stated visualization of the operation to be executed. What is critical is the linkage between current and future operations. Both

---

<sup>20</sup> Battle Command Battle Laboratory, 13.

<sup>21</sup> Ibid., 13-14.

elements, although a commander's responsibility, are fully developed by his staff and these elements should provide necessary information that enable subordinate commanders to act in the absence of orders or in unforeseen situations.

The last element, communication, links information to decisions and decisions to action.<sup>22</sup> Both joint doctrine and battle command consider communication critical because it's how the commander's intent is expressed to staffs and subordinates. Intent is an expression of the commander's vision of the operation, which helps to focus the organization on a common goal. Intent includes the tasks to be accomplished, their purpose, the method to get it done, and finally, the desired endstate. Effective communication is absolutely essential in the OODA Loop as the commander translates decisions into actions. The failure to communicate intent effectively or the inability to establish communications throughout the organization render information superiority and battlespace awareness as useless.

These elements that comprise the dynamics of battle command are not unfamiliar to joint doctrine. JV 2010, the CFJO, and the Joint Publications discuss many of these elements, albeit in less detail. More importantly, the dynamics of battle command suggest that at any level, decentralized command and control be required to successfully accomplish the mission. Commanders will have more decision relevant information on hand to consider and less time to consider it. They must become comfortable and proficient in using these elements for providing direction and maintaining control. Likewise, staffs have the potential to streamline and accelerate sound planning, decision-making, and control<sup>23</sup>

---

<sup>22</sup> Ibid., 14.

<sup>23</sup> Wass de Czege, 7.

## **Centralized or Decentralized Command and Control**

Much of the information regarding command and control at any level contains some discussion of whether its execution should be centralized or decentralized. Throughout this paper I have argued in favor of decentralized control for the simple reason that a commander simply can't control more than a certain number of units at any one time. The operational commander, in order to effectively command and control his forces, must decentralize execution to the lowest levels possible. Indeed, centralized planning is critical in understanding commander's intent, the concept of the operation, and the specific tasks required in order to accomplish operational or tactical objectives. Decentralized execution, however, is essential so those subordinate commanders retain the initiative and flexibility they must have to sustain freedom of action in battle. FM 100-5 argues that decentralization risks some loss of synchronization; commanders must balance competing risks, recognizing that loss of immediate control is preferable to inaction. Without question, decentralization demands well-trained subordinates and superiors who are willing to assume risks.<sup>24</sup> The CFJO concurs along similar lines contending that, "the intent of JV 2010 is to use information technologies to decentralize the execution of operations while allowing for appropriate involvement of the higher echelon commander."<sup>25</sup> As in any military operation, those with more clearly defined objectives and specified endstate will have a greater degree of decentralization.

Can operational commanders "command" extremely large organizations? The answer is yes; command is an art in which experience, knowledge, and the ability to

---

<sup>24</sup> Department of the Army, 2-6.

communicate effectively are fairly easily shared with many subordinate commanders. However, as previously argued, "control" or more importantly, "span of control" over a large organization should be more limited in order to be effective. In other words, operational commanders, based on a realistically limited span of control, cannot "control" any more than a certain number of subordinate units at one time. The tendency to over-centralize decisions will limit tempo and the employment of tools (information superiority, battlespace awareness, etc) available to the commander. Over-centralization also limits the dynamics of battle command. Therefore, decentralized control involves staff input and output to assist the commander in executing his intent. With all of the information systems available to the operational commander, he and his staff can provide subordinate level commanders with information critical for effective decentralized operations. Moreover, much of the information can be shared simultaneously, allowing subordinate commanders to conduct parallel planning. Information superiority reduces the need for filtering information from the operational to tactical level. Ideally, subordinate commanders will figure out what information is relevant and how to use it based on sound judgment and commander's intent.

In terms of centralization or decentralization, is it possible to further separate the two so that centralizing one function doesn't necessarily force commanders to centralize the other? The point is to not take for granted the notion that command and control is one function. By definition, one who commands also has the responsibility for and ability to control. Control, especially the span of control by any single individual, is limited in terms of numbers and time. Therefore, while the art of command may be a distinctly centralized function, the science of control must be reasonably decentralized to the lowest

---

<sup>25</sup> Commander, Joint Warfighting Center, 68.



command level possible while allowing for appropriate involvement of the higher level commander.<sup>26</sup> Command and control thus interact to ensure understanding at every level of command.

### **Conclusion**

In order to successfully meet the challenges on the future battlefields, JV2010 provides the JFC with new operational concepts, which when properly combined and balanced, ensure decisiveness in any operation. This ability to conduct decisive operations across the range of military operations is called *full spectrum dominance*.<sup>27</sup> Although this ability to dominate any adversary and control any situation in any operation relies heavily on the four new concepts, command and control is still the key to achieving success and accomplishing operational and tactical objectives.

Moreover, full spectrum dominance has little or no chance of success without proper command and control. Recognizing the command and control are separate functions, they must be linked together to bind the concepts critical to full spectrum dominance. The joint community should adopt the dynamics of Battle Command. This would solidify the idea of centralized command and decentralized control. Furthermore, it would firmly support not only the joint doctrine of decentralized execution, but would ground young leaders and students of joint doctrine in leadership and decision-making. Finally, there is no magical formula for deciding when centralized or decentralized control is most appropriate. Nonetheless, operational commanders must understand the limits of control, how important intent is, and the critical aspect of communication. If

---

<sup>26</sup> Nolan, 7.

<sup>27</sup> Commander, Joint Warfighting Center, 48.

commanders do these right, subordinate commanders will execute missions with great success.

Challenges on the battlefield in 2010 may not be so much different than what we face today. The United States' military continues to lead the way in technology, is exploiting new information systems, and is striving to better train and educate all military personnel, especially leaders at all levels. JV 2010 recognizes that this military advantage is not necessarily here to stay; therefore, we must continue to seek ways to improve our ability to fight our nation's wars and win. Certainly, we can expect changes to future wars in terms of operational tempo, the ambiguity or fog of war, and the need to make decisions more quickly in order to defeat an enemy who potentially has the ability to acquire and implement the technology and information systems we are developing.

## Bibliography

- Battle Command Battle Laboratory. Battle Command – Leadership and Decision Making For War and Operations Other Than War. (Draft 2.1) Fort Leavenworth, KS: April 22, 1994.
- Chairman, Joint Chiefs of Staff. National Military Strategy of the United States of America. Washington, D.C.: 1997.
- Chairman, Joint Chiefs of Staff. Joint Vision 2010. Washington, D.C.: Undated.
- Coats, Dan. "Joint Experimentation—Unlocking the Promise of the Future." Joint Force Quarterly, Autumn/Winter 1997-1998, 13-19.
- Headquarters, Department of the Army. Field Manual 100-5 Operations. Washington, D.C.: June 14, 1993.
- Joint Chiefs of Staff. Joint Doctrine Capstone and Keystone Primer. Washington, D.C.: July 15, 1997.
- Joint Warfighting Center. Concept for Future Joint Operations – Expanding Joint Vision 2010. Fort Monroe, VA: May 1997.
- Killebrew, Robert. "Focus on the Future." Army Magazine, May 1998, 30-38.
- Nolan, Daniel. "Battle Command." Unpublished Research Paper, U.S. Army Field Artillery Center, Fort Sill, OK: 1997.
- Ulmer, Walter F. Jr. "Military Leadership into the 21<sup>st</sup> Century: Another 'Bridge Too Far?'" Parameters, Spring 1998, 4-25.
- Van Riper, Paul and Scales, Robert H. Jr. "Preparing for War in the 21<sup>st</sup> Century." Parameters. Autumn 1997, 9-10.
- Vego, M. Operational Art Historical Companion. U.S. Naval War College, Newport, RI: Joint Military Operations Department, 1998.
- Vego, M. On Operational Art. U.S. Naval War College, Newport, RI: Joint Military Operations Department, 1998.
- Wass de Czege, Huba. "Battle Command Insights." Unpublished After Action Review, U.S. Army Advanced Warfighting Experiment on Battle Command, Fort Leavenworth, KS: 1996.
- Wishart, Leonard P., III. "Leader Development and Command and Control." Military Review. Jan-Feb 1997.